

WHAT IS CLAIMED IS:

- 1 1. An opto-mechanical interface apparatus comprising:
 - 2 an optical hybrid;
 - 3 an electronic hybrid adapted to receive electronic components;
 - 4 an adapter fixture for fixing the electronic hybrid and the optical hybrid to one another
 - 5 to form a combined hybrid;
 - 6 a lower-capsule part;
 - 7 an upper-capsule part adapted to mate with the lower-capsule part; and
 - 8 wherein mating of the upper-capsule part and the lower-capsule part encloses at least
 - 9 part of the combined hybrid.
- 1 2. The apparatus of claim 1, wherein the optical hybrid comprises:
 - 2 an optical chip;
 - 3 an optical-fiber connector; and
 - 4 a carrier.
- 1 3. The apparatus of claim 2, wherein the optical chip is selected from the group
2 consisting of a transmitter chip and a receiver chip.
- 1 4. The apparatus of claim 1, wherein the lower-capsule part comprises airing holes.
- 1 5. The apparatus of claim 1, wherein the upper-capsule part comprises airing holes.

1 6. The apparatus of claim 1, wherein the upper-capsule part and the lower-capsule part
2 are mated together via at least one of snap-locking, gluing, and ultra-sound welding.

1 7. The apparatus of claim 1, wherein:
2 the upper-capsule part and the lower-capsule part are mated together; and
3 the mated-together upper-capsule part and lower-capsule part form at least one cavity.

1 8. The apparatus of claim 7, wherein the at least one cavity comprises an upper cavity
2 and a lower cavity.

1 9. The apparatus of claim 8, wherein:
2 a first portion of the electronic components is contained within the upper cavity; and
3 a second portion of the electronic components is contained within the lower cavity.

1 10. The apparatus of claim 9, wherein:
2 the first portion of the electronic components comprises receiver electronics; and
3 the second portion of the electronic components comprises transmitter electronics.

1 11. The apparatus of claim 1, wherein:
2 the electronic hybrid comprises a printed circuit board (PCB); and
3 the electronic components are mounted on the PCB.

1 12. The apparatus of claim 1, wherein the PCB comprises:
2 a pin for making an external electrical connection; and
3 a stud for providing stability during assembly.

1 13. The apparatus of claim 1, wherein the lower-capsule part comprises a lead-through for
2 receiving a protrusion of the electronic hybrid, the protrusion selected from the group
3 consisting of a pin and a stud.

1 14. The apparatus of claim 1, wherein the lower-capsule part is adapted to permit accurate
2 positioning of the combined hybrid.

1 15. The apparatus of claim 1, wherein the upper-capsule part is adapted to fix contents of
2 the apparatus.

1 16. The apparatus of claim 1, wherein the optical hybrid comprises at least one of:
2 at least one fiber;
3 at least one transmitter; and
4 at least one receiver.

- 1 17. A method of assembling an opto-mechanical interface apparatus, the method
- 2 comprising:
 - 3 forming a combined hybrid, the step of forming the combined hybrid comprising:
 - 4 attaching an adapter fixture to an electronic hybrid; and
 - 5 attaching an optical hybrid to the electronic hybrid;
 - 6 placing the combined hybrid in a first capsule part;
 - 7 mating a second capsule part with the first capsule part; and
 - 8 wherein mating of the first capsule part and the second capsule part encloses at least
 - 9 part of the combined hybrid.
- 1 18. The method of claim 17, further comprising testing functionality of at least one
- 2 component of the apparatus prior to the mating step.
- 1 19. The method of claim 17, wherein the steps are performed in the order listed.
- 1 20. The method of claim 17, wherein the step of mating is performed via at least one of
- 2 gluing, snap-locking, and ultra-sound welding.
- 1 21. The method of claim 17, wherein the step of placing comprises positioning the
- 2 combined hybrid in the first capsule part.
- 1 22. The method of claim 17, wherein the step of mating comprises fixing contents of the
- 2 apparatus.

1 23. The method of claim 17, where in the first capsule part is a lower-capsule part and the
2 second capsule part is an upper-capsule part.